

# **Draft Weed Management Plan for the Palen Solar Electric Generating System**

**Riverside County, California**

**Docket 09-AFC-7C**

**Submitted by:**

**PALEN SOLAR HOLDINGS, LLC**

**Prepared by:**

The logo for Centerline, featuring the word "centerline" in a green, cursive script font, flanked by two horizontal green lines.

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## ABBREVIATIONS AND ACRONYMS

|                          |                                                             |
|--------------------------|-------------------------------------------------------------|
| BLM                      | Bureau of Land Management                                   |
| BMPs                     | Best Management Practices                                   |
| Cal-IPC                  | California Invasive Plant Council                           |
| CDCA                     | California Desert Conservation Area                         |
| CDFA                     | California Department of Food and Agriculture               |
| CDFW                     | California Department of Fish and Wildlife                  |
| CEC or Commission        | California Energy Commission                                |
| CPM                      | Compliance Project Manager                                  |
| DB                       | Designated Biologist                                        |
| ECM                      | Environmental Compliance Manager                            |
| FLPMA                    | Federal Land and Policy Management Act                      |
| GIS                      | Geographic Informational System                             |
| I-10                     | Interstate 10                                               |
| kV                       | kilovolt                                                    |
| LORS                     | Laws, Ordinances, Regulations, and Standards                |
| MW                       | megawatt                                                    |
| NECO                     | Northern and Eastern Colorado Desert Coordinated Management |
| PAR                      | Pesticide Application Record                                |
| PEIS                     | Programmatic Environmental Impact Statement                 |
| PPA                      | Plant Protection Act of 2000                                |
| Project                  | Palen Solar Electric Generating System                      |
| Project Disturbance Area | PSEGS footprint                                             |
| PSEGS                    | Palen Solar Electric Generating System                      |
| PSPP                     | Palen Solar Power Project                                   |
| PSH                      | Palen Solar Holdings, LLC                                   |
| PUP                      | Pesticide Use Proposal                                      |
| SCE                      | Southern California Edison                                  |
| SCG                      | Southern California Gas Company                             |
| SEIS                     | Supplemental Environmental Impact Statement                 |
| SRSG                     | solar receiver steam generator                              |
| U.S.C.                   | United States Code                                          |
| USDA                     | U.S. Department of Agriculture                              |
| USEPA                    | U.S. Environmental Protection Agency                        |
| USFWS                    | U.S. Fish and Wildlife Service                              |

WEAP

Worker Environmental Awareness Program

WMP

Weed Management Plan

## 1.0 INTRODUCTION

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### 1.1 Project Background

In August 2009, Palen Solar I, LLC (PSI), filed an Application For Certification (AFC) with the California Energy Commission (CEC or Commission) to construct and operate the Palen Solar Power Project (PSPP), a nominal 500 megawatt (MW) concentrating solar thermal electric power generating facility, in Riverside County using solar parabolic trough technology. The Commission issued a Final Decision approving two alternative configurations for the PSPP on December 15, 2010 (CEC 2010). Approved Reconfigured Alternative 3 focused the development of project facilities on federal land managed by the United States Bureau of Land Management (BLM), while Approved Reconfigured Alternative 2 allowed development of project facilities on federal land and on adjacent private parcels should PSI acquire the private parcels in the future.

On April 2, 2012 PSI, along with other Solar Millennium US-based companies, petitioned for relief in federal bankruptcy court. On June 21, 2012, the bankruptcy court approved the transfer of the project to BrightSource. The Commission subsequently approved a petition to amend the Final Decision to transfer ownership of the Project to Palen SEGS I, LLC, a wholly owned, indirect subsidiary of BrightSource (Order No. 12-0711-3). After approval of the ownership transfer of the Final Decision to Palen SEGS I, LLC, BrightSource and Abengoa Solar LLC formed a joint venture to develop the site using BrightSource's solar power tower technology. The joint venture company is known as Palen Solar Holdings (PSH) and the project has been renamed the Palen Solar Electric Generating System (PSEGS or Project).

The PSEGS site is located in the Southern California inland desert, approximately 10 miles east of Desert Center, in eastern Riverside County, California (see Figure 1, Vicinity Map). Project facilities will be located entirely on land managed by BLM, CACA # 48810, in Townships 5 and 6 South, Range 17 East.

PSEGS will replace the previously approved parabolic trough solar collection system and associated heat transfer fluid system with the BrightSource technology. The BrightSource technology uses heliostats—elevated mirrors guided by a tracking system mounted on a pylon—to focus the sun's rays on a solar receiver steam generator (SRSG) located atop a solar tower near the center of each solar field to create steam. The Project will be comprised of two adjacent solar fields and associated facilities with a total combined nominal output of approximately 500 MW. PSH proposes to develop PSEGS in two operational phases: each phase will consist of one solar field and power block with approximately 250 MW of electricity. Each phase will also share common facilities, including a common area containing an administration building, warehouse, evaporation ponds, maintenance complex and a meter/valve station for incoming natural gas service to the site; an onsite switchyard; and a single-circuit 230-kilovolt (kV) generation tie-line to deliver power to the electricity grid. Other onsite facilities will include access and maintenance roads (either dirt, gravel or paved), perimeter fencing, tortoise fencing and other ancillary security facilities (see Figure 2, Site Plan). Access to the site will be the same as the original and the PSEGS will continue to

interconnect to the regional transmission grid at Southern California Edison's (SCE) Red Bluff Substation, which is currently under construction.

The Project Disturbance Area, which includes both permanent and temporary disturbance, will be approximately 3,794 acres, and includes approximately 3575 acres for the Plant Site and approximately 119 acres for the linear facilities. No private parcels will be developed as part of the PSEGs project.

A revised Plan of Development has been submitted to the BLM and concurrent with the ongoing CEC permitting process, the BLM is preparing a Supplemental Environmental Impact Statement (SEIS) to support the process to issue a Record of Decision as required for PSH to utilize public lands owned by the federal government for the Modified Project. As part of the environmental review process, BLM has requested that PSH prepare and submit a draft Weed Management Plan (WMP) that can be evaluated as part of the Draft SEIS.

## 1.2 Plan Goals and Objectives

Condition of Certification BIO-14 in the CEC Final Decision for the original project requires preparation and implementation of a WMP. PSH has prepared this draft WMP to address monitoring, prevention, and management strategies for weed control during construction and operation of the Project. This document was prepared following guidance from other documents, including the approved weed management plans for the Ivanpah Solar Electric Generating System and Genesis Solar Project.

The goal of the WMP is to protect the biological resources surrounding the Project Disturbance Area from the expansion of weeds that may result from Project construction and maintenance activities and to avoid unintended harm from weed management techniques. To achieve this goal, the WMP provides specific guidance on early detection protocols, containment strategies, and control methods for noxious weeds. Noxious weeds are opportunistic, exotic plant species that readily colonize disturbed areas. Their introduction and spread often result in adverse effects to the environment and may also result in economic impacts. These plant species may exclude or out-compete desired native species and decrease species diversity.

WMP objectives need to be consistent with existing and proposed future Site conditions, the specific biology of the identified weed species, and environmental context of the Project. The WMP also must be consistent with all applicable Laws, Ordinances, Regulations, and Standards (LORS) (see Section 2.0). Weed management objectives for the Project include the following:

- **Prevention:** Prevent the introduction and spread of invasive weeds to the Project by implementing sound construction and site management strategies.
- **Monitoring:** Monitor the Project Disturbance Area on a specific schedule to ensure early detection and treatment of incipient populations of weeds that may be new to the Project Disturbance Area and/or vicinity, plus populations of weeds already present that may be spreading into new areas.

- **Eradication:** Eliminate all individuals of a particular species within specified areas. This will be the goal for most weed species in the Project disturbance area, and is appropriate where the weed is of considerable economic and environmental concern and the population size is manageable. This method is also important to eliminate incipient populations before they can become problematic.
- **Suppression:** Reduce current infestation density, but not necessarily directed at reducing the total area occupied by the infestation. This applies to many widely distributed, high-density weeds where complete eradication is not feasible.
- **Containment:** Prevent infestation expansion and spread, with or without any attempt to reduce infestation density. Containment focuses on halting spread until suppression or eradication can be implemented, and is practical only to the extent that the spread of seeds or vegetative propagules can be prevented.

### 1.3 Management Roles

The Project Owner is ultimately responsible for implementing this WMP. It is anticipated that the Project's Contractors and other designees responsible for implementing components of the WMP will include the following:

- **Contractor(s):** Contractual language will be included in all construction documents and ongoing maintenance contracts to ensure that all contractors, subcontractors, vendors, maintenance personnel and other parties performing either construction or ongoing maintenance or repairs at the Project site abide by and implement the provisions of this WMP. Implementing the construction provisions of this WMP will be a part of construction contracts.
- **Construction Manager:** The construction manager will have ultimate oversight of the construction contractor to ensure compliance with the provisions of this WMP.
- **Environmental Compliance Manager:** The Project Owner will designate an Environmental Compliance Manager (ECM) to provide oversight of construction practices and ensure compliance with the provisions of this WMP. The ECM (including support staff as needed) will be contracted directly and coordinate with the construction manager to ensure contractor compliance with environmental requirements for construction.
- **Designated Biologist:** PSEGS will designate a qualified biologist who will be responsible for the direction and oversight of compliance activities consistent with all onsite biological Conditions of Certification. The Designated Biologist (DB) will be responsible for compliance with the provisions of this plan and have authority to ensure compliance.



- **Bureau of Land Management (BLM):** As the administering land management agency, BLM will provide ultimate approval of the contents of this WMP and compliance oversight of its provisions. BLM will provide timely review of work products including this WMP, modifications or amendments to this WMP, and subsequent reports as required by this WMP.

## **2.0 RELATED AND APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS**

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The WMP will be consistent with all applicable Laws, Ordinances, Regulations, and Standards (LORS) described in this section.

### **2.1 Federal Laws and Regulations**

#### **2.1.1 Federal Noxious Weed Act of 1974**

The Federal Noxious Weed Act (7 United States Code [U.S.C.] §§ 2801-2814, January 3, 1975, as amended 1988 and 1994) provides for the control and management of non-indigenous weeds that injure, or have the potential to injure, the interests of agriculture and commerce, wildlife resources, or public health. The act gives the Secretary of Agriculture broad powers in regulating transactions in and movement of noxious weeds. It states that no person may import or move any noxious weed identified by regulations of the Secretary of Agriculture into or through the U.S. except in compliance with the regulations, which may require that permits be obtained. The act also requires each federal agency to develop a management program to control undesirable plants on federal lands under the agency's jurisdiction and to establish and adequately fund the program. Some of the provisions of this act were repealed by the Plant Protection Act of 2000 (PPA), including U.S.C. 2802 through 2813. However, Section 1 (findings and policy) and Section 15 (requirements of federal land management agencies to develop management plans) were not repealed (7 U.S.C. 2801 note; 7 U.S.C. 2814).

#### **2.1.2 Plant Protection Act (PPA) of 2000**

The PPA, as amended (7 U.S.C. 7701-7786) states that the detection, control, eradication, suppression, prevention, or retardation of the spread of plant pests or noxious weeds is necessary for the protection of the agriculture, environment, and economy of the U.S. This act defines the term "noxious weed" (7 U.S.C. 7702 § 403) to mean any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the U.S., the public health, or the environment. This act specifies that the Secretary of Agriculture may prohibit or restrict the importation, entry, exportation, or movement in interstate commerce of any noxious weed if it is determined "that the prohibition or restriction is necessary to prevent the introduction into the [U.S.] or the dissemination of a plant pest or noxious weed within the [U.S.]," and authorizes the issuance of implementing regulations. Subsequent regulations implemented by the Noxious Weed Control and Eradication Act of 2004 amended the PPA.

### **2.2 State and Local Laws and Regulations**

#### **2.2.1 California Food and Agricultural Code**

The California Food and Agricultural Code contains some detail on noxious weed management. Specifically, Food and Agricultural Code Section 403 states that the Department of Food and

Agriculture should prevent the introduction and spread of injurious insect or animal pests, plant diseases, and noxious weeds. Under Sections 7270 through 7224, the California Commissioner of Agriculture is granted the authority to investigate and control noxious weeds, and specifically to provide funding, research, and assistance to weed management entities, including eligible weed management areas or county agricultural commissioners, for the control and abatement of noxious weeds according to an approved integrated weed management plan.

California Food and Agriculture Code Section 5101 and 5205 provide for the certification of weed-free forage, such as hay, straw, and mulch. This portion of the code recognizes that many noxious weeds are spread through forage and ground covers. The code allows for in-field inspection and certification of crops to ensure that live roots, rhizomes, stolons, seeds, or other propagative plant parts of noxious weeds are not present in the crop to be harvested. Certified weed-free storage is required on BLM land, and any mulch or hay bale materials used for erosion control at PSEGS will be required to meet this certification.

## **2.3 Conservation and Management Plans**

### **2.3.1 Bureau of Land Management**

To address the use of chemical treatments in noxious weed control, BLM prepared the Programmatic Environmental Impact Statement (PEIS) entitled *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States* (BLM 2007). This document was the result of extensive public involvement and outlined the specific decisions, standard operating procedures, and mitigation measures for use of herbicides on BLM administered lands. The selected alternative of the PEIS identifies the active herbicidal ingredients approved for use on BLM land, and the herbicidal ingredients that are no longer approved for use. The Record of Decision for the PEIS defers the determination of areas that are to be treated through BLM's integrated pest management program to approved land use plans, and makes no land use or resource allocations in this regard. Appendix B of the PEIS, *Herbicide Treatment Standard Operating Procedures*, specifies management of noxious weeds through prevention and application of pesticides on BLM administered land. The procedures listed are incorporated as requirements of this Plan and are attached for reference (see Appendix A).

### **2.3.2 Northern and Eastern Colorado Desert Coordinated Management Plan**

The Northern and Eastern Colorado Desert Coordinated Management Plan (NECO Plan) (BLM 2002) is a landscape-scale, multi-agency planning effort that protects and conserves natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem, in which the Project lies. The 25-million-acre California Desert Conservation Area (CDCA) was designated in 1976 by the Federal Land Policy and Management Act to allow BLM to manage the resources of the California deserts. BLM developed a management plan for the CDCA in 1980 (BLM 1980), but the plan has since been amended and subdivided into four bioregion planning areas. The BLM has completed a regional plan amendment for each bioregion, among them the NECO Plan, which encompasses 5.5 million acres in the southeastern California Desert and the entire Project Disturbance Area.

## 3.0 NOXIOUS WEED INVENTORY AND BASELINE CONDITIONS

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### 3.1 Noxious Weed Definitions

The term “weed” has many different definitions. In the broadest sense, it is any plant growing where it is not wanted. Weeds can be native or non-native, invasive or non-invasive, and noxious or not noxious. A noxious weed is any plant designated by a federal, state or county government as injurious to public health, agriculture, recreation, wildlife, or property (Sheley et al. 1999). A noxious weed is “competitive, persistent, and pernicious” (James et al. 1991). Invasive weeds are any non-native plant species that are injurious to the public health, agriculture, recreation, wildlife habitat, or the biodiversity of native habitats. New invasive weeds are discovered in California every year. Any weed new to the site or new to the region will be handled through prevention and monitoring strategies as outlined in Sections 6 and 7 of this WMP.

Various regulatory agencies maintain definitions of “noxious weeds” and how they affect the environment. The California Department of Food and Agriculture (CDFA) Code Section 5004 maintains the most relevant definition to this WMP and defines noxious weeds as, “any species of plant which is, or is liable to be, detrimental or destructive and difficult to control or eradicate” (CDFA 2009). Noxious weeds are typically characterized as non-native plants that aggressively colonize new areas and can grow to dominate native plant communities, if uncontrolled. Noxious weeds can out-compete native vegetation, alter physical or chemical soil conditions, and dominate the landscape to the detriment of native plants and wildlife. Noxious weeds are often quick to colonize disturbed areas, including construction sites, roadsides, irrigated sites, or any other area with altered hydrology, soil structure, or soil chemistry.

Many invasive plant species share the trait of being adapted to disturbance and also out-compete some native species in these environments. The California Invasive Plant Council (Cal-IPC) categorizes invasive plants as high, moderate, or limited according to the severity of their ecological impact (Cal-IPC 2006):

- **High** – Invasive plants classified as high consist of species that have severe ecological impacts on physical processes, plant and animal communities and vegetation structure, and have a moderate to high rate of dispersal and establishment.
- **Moderate** – These species consist of species that have substantial and apparent (but not severe) ecological impacts and have a moderate to high rate of dispersal and establishment, although establishment is generally dependent upon a disturbance regime such as soil disruption or fire.
- **Limited** – These consist of species that are invasive, but their ecological impacts are minor on a state-wide level. Dispersal and establishment of species classified as limited are generally low to moderate.

These classifications are based on cumulative state-wide trends and can vary at local scales. As a result, a species classified as limited may be more invasive on a local scale than a species classified as high, depending on local conditions (Cal-IPC 2006). For this reason, all plants Cal-IPC classified invasive, even those classified as limited, can potentially impact a local ecosystem.

### 3.2 Noxious Weed Species of Concern

A list of noxious weeds of concern within the Project vicinity was compiled based on a review of a list of noxious weeds ranked by CDFA (CDFA 2009), the California Invasive Plant Council (Cal-IPC) (Cal-IPC 2009), the U.S. Department of Agriculture (USDA) California list (USDA 2009), weeds of special concern identified by the BLM, and field surveys of the Project disturbance area were conducted in support of the original AFC (AECOM 2009a).

An initial field assessment was followed by focused special-status plant surveys in April 2009. No invasive species on the Cal-IPC List (High, Moderate, and Limited [Cal-IPC 2009]) were noted as occurring in high concentrations (107.64 square feet) or nearly monotypic stands (AECOM 2009b). Table 3.2-1 lists the four non-native species detected during Project surveys in 2009 and 2010.

**TABLE 3.2-1  
WEED SPECIES OBSERVED WITHIN PROJECT BOUNDARIES**

| Scientific Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Common Name         | CDFA Rank* | Cal-IPC Rating* | USDA CA Rating* |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------|-----------------|-----------------|
| <i>Brassica tournefortii</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Sahara mustard      | -          | High            | -               |
| <i>Salsola tragus</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Russian thistle     | C          | Limited         | CW              |
| <i>Schismus barbatus</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Mediterranean grass | -          | Limited         | -               |
| <i>Tamarix</i> sp.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | tamarisk            | B          | High            | -               |
| <p><b>* Ranks/Ratings</b></p> <p><b>CDFA</b></p> <ul style="list-style-type: none"> <li>B – More wide spread. Eradication, containment, control or other holding action at the discretion of the commissioner. State endorsed holding action and eradication only when found in a nursery.</li> <li>C – Generally widespread throughout the state. Action to retard spread outside of nurseries at the discretion of the commissioner. Reject only when found in a crop seed for planting or at the discretion of the commissioner.</li> </ul> <p><b>Cal-IPC</b></p> <ul style="list-style-type: none"> <li>High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.</li> <li>Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.</li> <li>Limited – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.</li> </ul> <p><b>USDA CA</b></p> <ul style="list-style-type: none"> <li>CW – C list (noxious weeds)</li> </ul> |                     |            |                 |                 |

Source: AECOM 2009b. Palen Solar Power Project Botanical Survey Report, Riverside County, California.

## 4.0 WEED MANAGEMENT AREAS

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Weed management will occur site-wide and in all areas directly or indirectly affected by the project; however, different areas will require different specific management considerations depending on a range of factors described in this section. Weed Management Areas will include a 100-foot buffer surrounding the project site, including linear elements, except in downwind or downstream areas, in which case the buffer will expand as appropriate, to accommodate seed transport. In the event that weed species are noted to proliferate off the project site within the buffers, the project owner shall be held responsible for control of invasive species, and will need to timely notify and coordinate remedial action with BLM.

### 4.1 Temporary Disturbance Areas

Soil disturbance during construction and temporary use may create habitat well suited to disturbance-adapted invasive species and, therefore, measures to minimize the potential for weed introduction by personnel and equipment will be needed. Transmission line and natural gas pipeline construction will involve some temporary disturbance along with permanent tower placement and an access road for maintenance. Areas temporarily disturbed will promote weed invasion and establishment, and ongoing monitoring and management will be required. In addition, ongoing maintenance has the potential for ongoing introduction of weedy species through soil disturbance and equipment entrance, with ongoing weed management requirements. Potential areas meeting these criteria are described below.

#### Gas Pipeline

Southern California Gas Company (SCG) will construct a new approximately 2960 foot -long, 8-inch gas pipeline extension from its main transmission gas pipeline located approximately just south of I-10. A 50 foot- wide construction corridor will be used and most major pieces of construction equipment will remain along the pipeline route during construction. Regular weed monitoring and management during construction will be required, and weed management will be a key requirement of the revegetation effort after construction is complete.

#### Gen-tie Line and Telecommunications Cable

A single-circuit 230 kV generation tie-line will be constructed from the PSEGS switchyard to SCE's Red Bluff Substation. A telecommunications cable will be installed entirely underground entirely in the same right of way as the gen-tie line in a trench approximately 12 inches wide. Regular weed monitoring and management during construction will be required. Some areas temporarily disturbed during construction will require revegetation, and weed management will be required at revegetated areas. Access for gen-tie line tower inspection and cleaning will occur along the transmission line. This has the potential for ongoing introduction of weedy species through soil disturbance and equipment entrance, and will necessitate ongoing implementation of weed management requirements.

#### Staging and Laydown Areas

An approximately 218 acre temporary construction laydown area will serve as the location for laydown of materials, staging of traffic to avoid congestion on the I-10/Corn Springs interchange, and may be the temporary location of the concrete batch plant. This area has the potential for ongoing introduction of weedy species through soil disturbance and equipment entrance, and will necessitate ongoing implementation of weed management requirements. Approximately 169 acres of the total 218 area is not planned for temporary or permanent use but will be inside the desert tortoise and security fence.

## **4.2 Long-term Disturbed Areas**

The areas described in this section would be permanently developed, but could support weedy species function as seed reservoirs to adjacent natural habitats if not managed. Further, without management, the disturbance associated with the construction of the associated facilities would likely promote density increases and population spread of weedy species.

### Heliostat Arrays and Service Tanks

The PSEGS will replace the parabolic trough solar collection system and associated HTF with BrightSource Inc. technology. The BrightSource technology uses heliostats—elevated mirrors guided by a tracking system mounted on a pylon—to focus the sun’s rays on the SRSG located atop a solar tower near the center of each solar field to create steam. Each of the heliostat assemblies is composed of two mirrors, each approximately 12 feet high by 8.5 feet wide, with a total reflecting surface of 204.7 square feet. Each heliostat assembly is mounted on a single pylon, along with a computer-programmed aiming control system that directs the motion of the heliostat to track the movement of the sun. The final layout will be completed during detailed design but is expected to consist of approximately 85,000 heliostats in each solar field.

Heliostat arrays will set atop existing soil surfaces. Vegetation clearing, grubbing, and contour smoothing in the heliostat fields will occur where necessary to allow for equipment access and storm water management. Surface preparation will consist of shallow (less than 6 inches deep) blading of curvilinear, concentric service tracks (referred to as “drive zones”), and parallel rows of heliostats. The drive zones will be cleared, grubbed, smoothed and rolled to permit safe and efficient installation of the heliostats and washing of the mirrors. In areas where these activities are not required for access or construction, the vegetation will not be removed but will be mowed (if needed) to a height of approximately 12 to 18 inches. Post-construction cleaning and other routine maintenance activities will result in continuing disturbance of much smaller areas.

Soil disturbance during construction will create habitat well suited to disturbance-adapted invasive species, and the continual use of the area by personnel and heavy equipment has the potential to introduce weed propagules. During operations, equipment and personnel will continue to access the area for heliostat cleaning and other maintenance. Wash water overflow from the ongoing cleaning of heliostat mirrors will provide a water source to support weed establishment and growth.



## Roads and Other Internal Features

Roadsides and the medians of unpaved service tracks are vulnerable to weed invasion. Internal roads may alter local hydrology; are subject to initial and ongoing disturbance during construction, maintenance, and use; provide topographic variation that could capture windborne or waterborne seed; and may be subject to seed distribution from passing vehicles. Other features of the solar field may enhance weed establishment. This may include soils that have been cleared, compacted, or otherwise disturbed, areas where hydrology is altered, such as from increased drainage from developed areas, or areas where continued vehicle or foot traffic persist.

### **4.3 As-Built Mapping**

Upon completion of construction, the applicant will prepare “as built” maps designating temporary disturbance, permanent disturbance, landscaped areas, other permanent facilities, and buffer areas. This map will be appended to the WMP to facilitate compliance monitoring. The map will have the following features:

- maximum map scale of 1 inch = 400 feet
- boundaries of the Weed Management Area (WMA), including buffer areas
- Vegetation mapping in the WMA
- land ownership boundaries
- non-native weed populations found during the AFC studies and classified as noxious
- boundaries of any conservation plan or special management areas
- location of high-risk area relating to project operation
- clearly depict the location of special-status plant and animals that remain in the area
- any other sensitive biological resources found within the WMA

## **5.0 MONITORING AND SURVEY METHODS**

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### **5.1 Weed Identification**

The Designated Biologist will assure that weed identifications are conducted by qualified botanists. Unknown species will be collected, pressed and dried, and delivered to the UC Riverside Herbarium or the California Department of Agriculture Weed Herbarium in Davis, with a specimen label, as a permanent scientific specimen. Upon identification by qualified botanists, the Designated Biologist will determine a course of action. Monitoring and removal of weeds requires skill and training in plant identification. Training in plant identification and field manuals with photographs of native desert plants and of common weeds will be provided to all field staff including biological monitors, weed abatement contractors, plant operators and staff, and construction workers.

### **5.2 Surveys and Monitoring**

#### **5.2.1 Monitoring Methods**

Surveys and monitoring will ensure timely detection and prompt eradication of weed infestations, which are essential to a long-term strategy for weed management.

##### Construction Areas

The ECM and DB will oversee biological monitors who will be on-site during site clearing and construction activities. Biological monitors will be responsible for inspecting all construction areas, identifying the presence of noxious weeds, and inspecting equipment cleaning facilities for weed seed removal. The ECM will be responsible for prescribing management activities consistent with this plan when weeds become established. Monitoring of all construction areas, including access routes, will be conducted every other week for four weeks following storms of any intensity (including summer monsoons) and also every third week during March, April, and May if there has been any winter rain. This monitoring will consist of walking or driving slowly over construction areas and observing for seedlings of exotic species. This will continue until ground-disturbing construction activities are completed.

##### Revegetation Areas

As part of monitoring for revegetation, the density and/or frequency of non-native species will be quantitatively measured in selected sampling sites throughout the revegetation area and compared to control areas. At a minimum, additional monitoring also will occur every third week during each March, April, and May when there has been no revegetation monitoring and similarly in the fall after summer/fall monsoons; this will occur every year during construction and for a minimum of six years following the completion of construction. Monitoring schedules will be sufficiently flexible to take advantage of the variable precipitation regime of the eastern Mojave Desert. Surveys will identify areas of significant weed invasion or establishment and the weed species involved.

As part of monitoring for revegetation, the density and/or frequency of non-native species will be quantitatively measured and compared to control areas.

#### General Operations Monitoring

Monitoring of all potential weed enhancement areas will be conducted every other week for four weeks following storms of any intensity (including summer monsoons) and also every third week during March, April, and May if there has been any winter rain. This monitoring will consist of walking or driving slowly over construction areas and observing for seedlings of exotic species. This will continue for the life of the Project or until success criteria (as set forth in the separate Revegetation and Rehabilitation Plan) are met.

#### Treatment Areas

Where weed treatments are implemented, the treated areas will be monitored to ensure that treatments are effective. Monitoring will continue at pre-treatment frequencies until noxious weeds in the area are eliminated or satisfactorily controlled. Monitoring will occur at the same frequency as defined above.

#### Offsite Areas

Because potential exists for weed infestations on the PSEGS site to spread to adjacent areas or enhance existing populations outside the project ROW, weed monitoring will include monitoring adjacent BLM lands for a minimum of 100 feet outside of the Project Disturbance Area, and an extended area in downstream and downwind areas, until the infestation is fully eradicated or populations do not exceed baseline or control populations. Monitoring will occur at the same frequency as defined above.

### **5.2.2 Database and Mapping**

Locations of noxious weed occurrences, with data on species, detection date, growth stage, infestation extent, treatments implemented, results of treatment, and current status, will be maintained during the construction and operation phases. A geographic information system (GIS) will be used to map and store data.

A priority system of areas populated by noxious weeds will be established based on species, vulnerability of the site to invasion, growth stage, and effectiveness of treatment. Vulnerability will be assessed on the following: (1) availability of weed propagule sources, such as along roadsides, near soil stockpiles; (2) areas with enhanced microsite suitability; (3) areas outside the WMA that have existing weed populations or, prior or treated weed.

## 6.0 NOXIOUS WEED MANAGEMENT

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### 6.1 Species Descriptions and Management Strategy

Descriptions of the more common or troublesome noxious weeds occurring or potentially occurring at the Site are provided in this section, along with the basic weed management strategy applicable to each. Appendix B provides a complete list of the weed species of concern in this area. Management strategies must encompass not only eradication, but also identify the means of eradication and the plant species to be eradicated.

Not all invasive plant species can or, arguably, should be eradicated. Certain exotic species at the Project site are beyond the control of a single project, if controllable at all. This applies specifically to *Schismus barbatus*, a ubiquitous Mediterranean annual that is now a dominant understory species throughout the southwestern deserts. *Schismus* also can play a beneficial role as a forage species for desert tortoise and other herbivores and by enhancing surface stabilization, thereby helping to reduce soil erosion caused by sheet flow or high winds. Complete eradication of large areas where infestations are already established would likely adversely affect other pioneer species, and is likely to be impractical because the area is likely to be re-invaded from adjacent lands in the absence of physical barriers that isolate the area.

The following list provides brief descriptions of the weed species of particular concern at the PSEGS site and control objectives:

- Sahara mustard, (*Brassica tournefortii*) was observed onsite and in the vicinity and is of high concern. Cal-IPC has declared this plant highly invasive (Cal-IPC 2009). This species will be eradicated whenever encountered.
- Russian thistle (*Salsola tragus*) is a dominant species in the dunes along Palen lake (AECOM 2009a:44 and 81) and was identified as a scattered understory species in the microphyll woodland (AECOM 2009b:7). Although it has a Cal-IPC “Limited” rating, it is highly invasive given suitable germination substrates. This species will be eradicated whenever encountered.
- Tamarisk (*Tamarix* sp.) is probably a rare species at the Project, but occurs in nearby agricultural areas as a windbreak. (AECOM [2009a:43] listed it as interspersed throughout the microphyll woodland, but this seems unlikely or, at least, the species is uncommon. AECOM did not discuss it this species in the results and analyses sections. It most commonly germinates where water is available, so it has a low likelihood of occurring at the Project, but is easily eradicated when controlled early during its growth. It has a Cal-IPC “High” rating. This species will be eradicated whenever encountered.

#### 6.1.1 New Weeds

Weeds not previously reported for the area or anticipated could colonize the site or invade site facilities, both during construction as well as during operation. During construction, the Designated Biologist will be required to regularly update the list of noxious weeds that are present, and identify any new potential threats. This will include developing a management

strategy and management methods appropriate to the plant species and the nature of any potential invasion. Similarly, the facility plant manager or appropriate designee during operations will be required to continually update the noxious weed list and provide monitoring and management appropriate to any new species.

## **6.2 Preventative Measures**

General measures which may be implemented to prevent the spread of weed propagules and inhibit their establishment on the Project include the following:

- Conducting pre-construction surveys and treating potential sources on or near the Project prior to ground disturbance.
- Limiting disturbance areas during construction to the minimal area required to perform work and limiting ingress and egress to designated routes.
- Maintaining vehicle wash and inspection stations and closely monitoring the types of materials brought onto the Project to minimize the potential for weed introduction.
- Educating workers about invasive weeds potentially problematic at the Project and enlisting their help in preventing their introduction and spread.
- Reestablishing vegetation as quickly as practicable on disturbed sites as an effective long-term strategy to avoid weed invasions.

Some guidelines for preventing weeds from entering public lands and spreading to new uninfested areas are listed below (BLM 2009).

- Preventing introduction through contaminated seed, feed, mulch, gravel or fill
- Preventing introduction through movement of animals, people or machinery
- Preventing introduction through minimizing disturbance
- Preventing introduction through proper planning.

All of these methods have been considered during preparation of this draft WMP and will be implemented during construction, operation and decommissioning of the project.

### **6.2.1 Construction**

#### Worker Environmental Training

Noxious weed management will be incorporated as a part of mandatory site Worker Environmental Awareness Program (WEAP) for all contractors or related personnel entering the Project during construction. This will include all contractors, subcontractors, inspection personnel, construction managers, construction personnel, and individuals bringing vehicles or equipment onto the Project. It may also include general delivery personnel if delivery requires accessing any roads beyond immediate construction office locations.

The WEAP will be required upon first entry of any construction personnel onto the site. Training will include instruction on weed identification and a training module on the impacts of noxious weeds on agriculture, livestock, wildlife, and fire hazard. Impacts of noxious weeds on native

vegetation, wildlife, and fire activity will be discussed including an explanation of how invasive grasses provide a fine fuel understory which can spread fire from shrub to shrub and how this has historically been absent in the native desert ecosystem. The measures to prevent the spread of noxious weeds in areas currently un-infested, and controls on their proliferation when already present, will also be explained. Personnel having completed WEAP training will be required to visibly show evidence of WEAP completion on their person at all times while on the construction site (e.g., through a hardhat sticker).

The ECM will be responsible to implement the WEAP and ensure all site workers are appropriately trained.

### Wash Stations

The contractor, with ECM oversight and the DB and/or Biological Monitors, will ensure that vehicles and equipment are free of soil and debris capable of transporting noxious weed seeds, roots, or rhizomes before the vehicles and equipment are allowed travel onto or off of the Project, including access roads on the gen-tie. Plates will be installed at the entry to the access road from the freeway that are designed to shake seeds and dirt from the vehicles as they travel over them. Inspection and wash station(s) will be set up in staging areas to remove any dirt or mud that could be attached to construction vehicles and which may contain weed seeds and all vehicles entering from offsite locations will be required to stop for inspection and cleaning. Heavy equipment entering the site on trailers also will require cleaning if verification of cleaning prior to entering the site cannot be provided.. Wash station locations will be determined during final design, but will be located to cover all entry of construction personnel or vehicles onto the site. As many inspection and wash stations as necessary will be set up to cover all outside entries onto the construction site or to efficiently service vehicles entering.

Wash stations will not be located in or adjacent to any natural drainages and will be located away from any sensitive biological resources. They will be constructed with either a concrete wash pad, or a completely cleared and compacted soil or gravel pad. Silt fencing, weed-free certified hay bales, or other means of trapping wash water sediment and seeds will be installed around the perimeter of wash stations. A concept design of a wash station is shown on Figure 3, Conceptual Wash Station Plan . Alternatively, self-contained wash stations with the design approved by the ECM and DB may be used.

The ECM will have ultimate oversight of the vehicle wash program and ensure it is fully and effectually implemented, with contractor compliance. Wash stations and vehicle washing will be conducted during all construction phases.

### Infestation Containment and Control

During construction, areas of concern will be identified and flagged in the field by biological monitors and immediate control measures will be implemented as described in the sections below. As much as possible, contractors will avoid or minimize all types of travel through weed-infested areas where treatments are incomplete. The Contractor will begin project operations in weed-free areas whenever feasible before operating in weed-infested areas, until the DB has verified completion of weed treatments.

### Site Soil and Cleared Vegetation Management

The Contractor will limit the size of any vegetation and/or ground disturbance to the absolute minimum necessary to perform the activity safely and as designed. The Contractor will also avoid creating soil conditions that promote weed germination and establishment as practicable. Soil conditions that promote weed germination and establishment include soil excavation/disturbance, vegetation removal, soil compaction, loss or removal of topsoil, introduction of any chemical compounds, including fertilizer, and soil stockpiling. In areas where infestations are identified, the Contractor will stockpile cleared vegetation and salvaged topsoil adjacent to the area from which they are stripped to eliminate the transport of soil-borne noxious weed seeds, roots, or rhizomes. During reclamation, the Contractor will return topsoil and vegetative material from infestation sites to the areas from which they were stripped. Vegetation material from weed-infested sites will not be used as vertical mulch in other areas that are also not populated by the same weed species.

### Weed-Free Products

The Contractor will ensure that straw or hay bales and coirs used for sediment barrier installations are obtained from certified sources that are free of primary noxious weeds. Additional products such as gravel, mulch, and soil, may also carry weeds. Such products should be obtained from suppliers who can provide weed-free certified materials. Where feasible, mulch will be generated from native vegetation cleared from the Project itself. Soil will not be imported onto the site except in instances where it can be ensured to be free of weeds that are not currently at the site, and also free of weed seeds in high concentrations.

### Weed-Free Seed

Seed purchased from commercial vendors for site restoration and revegetation will be labeled in compliance with the relevant provisions of the California Agriculture Code. In addition to having the correct label, the seed should be required to be free of noxious weeds and the label should so state. Preferably, seed should be collected from adjacent areas, which provides the additional benefit of ensuring local genetic stock. The DB, Energy Commission Compliance Project Manager (CPM), and BLM Authorized Officer will have access to proof of use of weed-free seed, and any other weed treatment information, schedules, or relevant information upon request.

## **6.2.2 Operations**

### Facility Staff Training

Noxious weed management will be incorporated as a part of mandatory WEAP training for groundskeepers and maintenance personnel. Training will include weed identification and the impacts on agriculture, livestock, wildlife, and fire frequencies. The importance of preventing the spread of noxious weeds in areas currently un-infested, and controlling the proliferation of weeds already present, will also be explained.



## Infestation Containment and Control

During operations, areas of concern will be identified and flagged in the field by trained Project personnel or the DB. The flagging will alert personnel that weeds are present and will prevent access into these areas until noxious weed management control measures have been implemented. Immediate control measures will be implemented. Immediate control measures will be implemented as described in Section 6 of this WMP.

### **6.2.3 Site Closure**

Site decommissioning and closure will involve implementation of the PSEGS Decommissioning and Reclamation Plan as required by the BLM. This plan will include measures to avoid weed establishment throughout the site and to implement long-term site rehabilitation and revegetation of all decommissioned facilities. Control of noxious weed establishment will be a central goal of long-term site rehabilitation, the long-term success of which will be enhanced by revegetation measures promoting surface stability and soil development.

## **6.3 Eradication and Control Methods**

Mowing will be used as a management tool for other site operation requirements at PSEGS (e.g., preserving access to heliostat arrays).

In general, mowing for weed control is a poor solution and will not be implemented at PSEGS for that purpose. It is sometimes used as a fire control method, but will result in proliferation of weed seed and aggravation of weed infestation problems if it occurs following seed set, when fire control by mowing would generally occur. Instead of using mowing to control weeds, the manual methods discussed below will be implemented.

### **6.3.1 Physical Removal of Weeds**

Physical control methods will include manual hand pulling of weeds and hoeing. For localized weed control, this is an effective, if labor-intensive method. Hand-pulling is less effective in large areas with high weed density. Hand pulling and weeding must only be employed before the seed has set, otherwise this disturbance would only serve to further disperse and promote the establishment of the weed species. Removed plant material should be bagged and removed.

### **6.3.2 Chemical Methods for Weed Prevention or Removal**

The Project Owner is not proposing the use of herbicides as part of this Weed Management Plan.

### **6.3.3 Competitive Vegetation**

With site rehabilitation and revegetation of temporarily disturbed areas, soil structure and native plant communities will reestablish. While full recovery may take decades, early successional communities can be established on the site within one to a few years and, over time, weed control may require less effort.



## **7.0 REPORTING REQUIREMENTS**

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Implementation of the WMP will include the following data collection and reporting. Reports will be subject to the Revegetation and Project Adaptive Management process described in the Site Rehabilitation and Revegetation Plan. Each party will retain reports in their files according to respective internal policies.

### **7.1 Construction Reports**

During the construction phase, ongoing reporting on noxious weed management will be included in monitoring reports. Construction weed monitoring reports will include the following information:

- Survey findings on location, type, extent, and density of noxious weeds. This data will include mapping and photographs, as appropriate, as well as textual and tabular data content to fully describe conditions on the Project.
- Management efforts, including date, location, type of treatment implemented, and results. Ongoing evaluation of success of treatment will be included.
- Information on implementation and success of preventative measures, including status of equipment wash facilities and summary data of use; data on the worker environmental training program, including participants.
- Summary description of restoration efforts undertaken, adaptive measures employed based on on-the-ground conditions, and the current status of the effort.

### **7.2 Long-term Monitoring Reports**

After implementation of site revegetation, long-term monitoring reports will be focused on success of revegetation sites. These reports will include:

- Survey findings on location, type, extent, and density of noxious weeds. These data will include mapping and photographs, newly identified species, submissions to herbaria, as appropriate, as well as textual and tabular data content to fully describe conditions on the project site.
- Management efforts, including date of efforts, location, types of treatment implemented, and results. Ongoing evaluation of success of treatment will be included.
- The reports will also include a complete description of restoration efforts and status with regard to performance criteria.

## **7.3 Reporting Periods**

### **7.2.1 Construction Period**

The ECM and monitoring team will maintain all monitoring records. These records will be summarized into monthly summary reports, where relevant, describing information relevant to noxious weed management. All data will be included in annual reports.

A single post-construction report will be produced after each phase of construction is completed at PSEGS, with a section summarizing the overall results of noxious weed management and weed status at the site. Construction reports will be made available to agency personnel. Agency personnel and contact information will be identified and would include the BLM and the CEC.

### **7.2.2 Long-term Monitoring Reports**

Annual monitoring reports will be produced for the duration of the monitoring period. These reports will discuss the results of monitoring and weed control activities. Once success criteria are met, a final monitoring report will be produced to describe the outcome to date of proposed restoration, including status of noxious weed management on the project site. All annual monitoring reports will be made available to agency personnel. Agency personnel and contact information will be identified and would include the BLM and the CEC.

## 8.0 REFERENCES

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